Listing of Claims:

1. (Previously Presented) An optical processing method comprising:

receiving an optical signal from an optical system, wherein the optical signal is distorted by frequency-dependent polarization effects in the optical system that cause wavelength dependent changes in the state of polarization (SOP) of the optical signal;

spatially dispersing frequency components of the distorted optical signal on at least one spatial light modulator (SLM); and

independently adjusting the polarization transfer matrix of multiple regions of the at least one SLM to reduce the distortion of the optical signal.

2. (Canceled)

3. (Original) The method of claim 1, wherein the frequency-dependent polarization effects include polarization mode dispersion effects.

4. (Original) The method of claim 3, wherein the polarization mode dispersion effects can be represented by a frequency-dependent polarization transfer matrix characterized by a frequency-dependent differential delay and principal states of polarization.

5. (Original) The method of claim 1, wherein the optical signal comprises multiple signals on separate wavelength bands.

6. (Original) The method of claim 1, wherein the optical system includes at least one optical fiber.

7. (Original) The method of claim 1, further comprising recombining the spatially dispersed frequency components following the adjustments by the spatial light modulator.

8. (Original) The method of claim 1, further comprising monitoring the frequency-dependent polarization effects from the optical system.

9. (Original) The method of claim 8, wherein the adjustments by the spatial light modulator are in response to the monitoring of the frequency-dependent polarization effects.

10. (Original) The method of claim 1, wherein the spatial dispersion of the frequency components comprises using a grating, a prism, an arrayed waveguide grating, or a virtually imaged phase array.

11. (Original) The method of claim 1, wherein the spatial light modulator comprises at least one liquid crystal layer.

12. (Original) The method of claim 11, wherein the spatial light modulator comprises at least two liquid crystal (LC) layers, wherein the LC molecules in each of the LC layers are oriented along an axis, and wherein the axis for one of the LC layers is different from the axis of another of the LC layers.

13. (Original) The method of claim 12, wherein the axes differ from one another by an absolute amount of about 45 degrees.

14. (Original) The method of claim 13, wherein the absolute amount is in the range of 42 degrees to 48 degrees.

15. (Original) The method of claim 12, wherein the spatial light modulator comprises at least three layers.

16. (Original) The method of claim 15, wherein the orientation axis of a first of the LC layers differs from the orientation axis of a second of the LC layer by absolute amount of about 45 degrees, and wherein the orientation of the second of the LC layers differs from the orientation axis of a third of the LC layers by an absolute amount of about 45 degrees.

17. (Original) The method of claim 1, wherein the adjustments to the polarization transfer matrix are selected to cause an adjustment to at least one of the phase, state of polarization (SOP), and amplitude of each of multiple subsets of the spatially dispersed frequency components.

18. (Original) The method of claim 1, wherein the adjustments to the polarization transfer matrix are selected to cause an adjustment to at least one of the phase and the state of polarization (SOP) of each of multiple subsets of the spatially dispersed frequency components.

19. (Original) The method of claim 1, wherein the adjustments to the polarization transfer matrix are selected to cause an adjustment to the state of polarization (SOP) of each of multiple subsets of the spatially dispersed frequency components.

20. (Original) The method of claim 1, wherein the adjustments to the polarization transfer matrix are selected to cause independent adjustments to the phase and the state of polarization (SOP) of each of multiple subsets of the spatially dispersed frequency components.

21. (Original) The method of claim 20, wherein the frequency-dependent polarization effects include polarization mode dispersion (PMD), and the adjustments caused by the SLM at least partially compensate for the PMD.

22. (Original) The method of claim 1, wherein the distortions comprise broadening of mean pulse duration in the optical signal, and wherein the adjustments reduce the broadening caused by the optical system.

23. (Original) The method of claim 1, wherein the adjustments are selected to cause the state of polarization (SOP) of at least some of the frequency components to be substantially the same.

24. (Original) The method of claim 23, wherein the adjustments are selected to cause the delay of the at least some of the frequency components to be substantially the same.

25.-48. Canceled.

49. (Original) The method of claim 1, further comprising using the SLM to selectively vary the intensity of at least some of the spatially dispersed frequency components.

50.-69. Canceled.

70. (Original) The method of claim 1, wherein the adjustments are selected to independently delay a selected polarization component of each of multiple subsets of the spatially dispersed frequency components.

71.-72. Canceled.

73. (Original) The method of claim 23, wherein the adjustments are selected to cause the phase of the at least some of the frequency components to be substantially the same.

74. (Original) The method of claim 23, wherein the adjustments are selected to cause the phase of the at least some of the frequency components to vary substantially linearly with frequency.

75.-76. Canceled.

77. (Previously Presented) An optical processing system for reducing a distortion in an optical signal transmitted through an optical system having frequency-dependent polarization effects that cause wavelength dependent changes in the state of polarization (SOP) of the optical signal, the optical processing system comprising:

a dispersive module positioned to receive the optical signal and spatially separate frequency components of the optical signal;

at least one spatial light modulator (SLM) having multiple regions with an independently adjustable polarization transfer matrix, the at least one SLM positioned to receive the spatially separated frequency components on the multiple regions; and

a controller coupled to the at least one SLM, wherein during operation the controller causes the at least one SLM to independently adjust the polarization transfer matrix of the multiple regions to reduce the distortion of the optical signal.

78.- 79. Canceled.

80. (Previously Presented) The method of claim 1, wherein the at least one spatial light modulator (SLM) comprises multiple spatial light modulators optically coupled to one another.

81. (Previously Presented) The method of claim 80, wherein the spatial light modulators are optically coupled to one another by an optical fiber.

82. (Previously Presented) The system of claim 77, wherein the at least one spatial light modulator (SLM) comprises multiple spatial light modulators optically coupled to one another.

83. (Previously Presented) The system of claim 82, wherein the spatial light modulators are optically coupled to one another by an optical fiber.